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## EUROPEAN PATENT APPLICATION

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⑦ Applicant: TAC RIVETING SYSTEM di Oggionni Pier Giorgio & C. s.a.s., 3, Via Thaon di Revel, Milano (IT)

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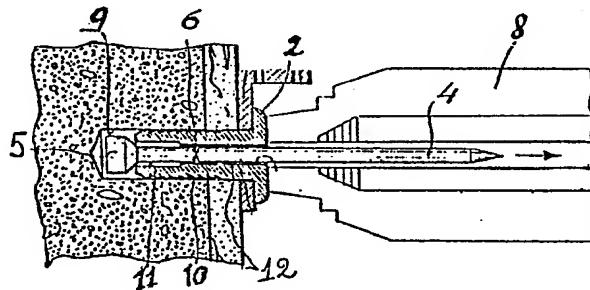
⑧ Inventor: Oggionni, Pier Giorgio, Via Thaon di Revel, 3, I-20159 - Milano (IT)

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⑨ Representative: Cicogna, Franco, Ufficio Internazionale  
Brevetti Dott.Prof. Franco Cicogna Via Visconti di Modrone, 14/A, I-20122 Milano (IT)

### ⑩ Wall dowel.

⑪ The expanding nog or insert comprises an outer sleeve (1) provided for insertion into a hole (9) as formed in a wall, and provided with an expanding portion (10) and an outer flange (2). Within the sleeve (1) a shank (4) is able of sliding, provided with a preferably countersunk head portion (5) and projecting from the outer or embedded into the wall flange (2) for a length to be engaged by a riveting machine (8). The shank (4) is further provided with a weakened portion (6) for breaking the shank (4) after application.



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The present invention relates to an improved metal expanding nog, for anchoring articles to solid walls, that is walls devoid of any hollows resulting from possible wall gaps or hollow tiles.

There are known and presently used several expanding metal nogs or inserts which are more or less structure-wise simple, both from the making and practical use standpoint.

It should however be noted that an excessive simplicity does not mean a corresponding safety and, moreover, it, frequently, does not solve satisfactorily the anchoring problem, thereby further operative steps or additional elements are necessary for using the known expanding nogs in order to firmly anchor articles to a wall.

On the other hand, an excessively complex structure negatively affects the production cost of the nog as well as the marketing success thereof.

Accordingly, the main object of the present invention is to provide such an improved expanding metal nog or insert which does not require for installation any additional anchoring elements and which may be applied to a solid wall in a very simple way.

Another object of the invention is to provide such a metal nog or insert which may be made

with a simple construction, while being effective to be applied by the known commercially available riveting machines.

According to one aspect of the present invention, the above objects, as well as yet other objects which will become more apparent hereinafter, are achieved by an improved expanding nog or insert, for anchoring articles to solid walls, characterized in that it comprises an outer sleeve effective to be engaged in a hole as formed in a wall and provided with an expanding portion and an outer flange, in said sleeve there being slidably housed a shank provided, at said expanding portion, with a countersunk and enlargerd head, and projecting from said outer flange for a length effective to be engaged by a riveting machine, said shank being provided, at a region inside said sleeve, with a weakened portion for breaking said shank after the application of said nog.

The above and other characteristics, of functional and constructional nature of the improved expanding metal nog according to the present invention, will become more apparent hereinafter, with reference to the figures of the accompanying drawings, where:

Fig. 1 illustrates the step of drilling a hole in a wall by means of a drilling machine or the like;

Fig. 2 illustrates the step of inserting

into the wall the nog according to the invention, by means of a riveting machine;

Fig. 3 illustrates the step of deforming the expanding portion of the nog, by pulling on its shank portion;

Figs. 4 and 5 illustrate the nog according to the invention, as inserted in the wall and provided, in addition to a flange-shaped enlarged outer ring, with an expanding portion thereto a threaded bracket may be associated for supporting cables and pipes;

Fig. 6 is a perspective view illustrating the improved metal nog according to the invention, before application;

Fig. 7 is a cross-sectional view illustrating a simplified embodiment of the nog according to the invention.

With reference to the above mentioned figures, the improved expanding metal nog according to the invention comprises an outer sleeve 1 including an expanding portion 10, an outer flange 2, a threaded portion 3 and a long cylindrical shank portion 4, slidably housed in said sleeve 1, and provided with a head having a countersunk or flat under-head 5 and with a weakened portion 6.

More specifically, said shank 6 is housed within the sleeve 1 in such a way that the head 5 is located on the side of the expanding portion 10,

whereas the weakened portion 6 is located inside the sleeve 1.

The sleeve 1 defines, in its inside, an axially extending hole including first enlarged portion 11, having a diameter slightly less than the diameter of the head 5, and a second narrowed portion 10 which acts as a stop abutment for the translation of the shank 4 as the nog is applied to the wall.

As it should be apparent, in the embodiment illustrated in Figs. 1 to 6, upon having inserted the nog into the hole 9 formed in the wall, as far as to cause the rear face of the outer flange 2 to abut thereagainst, by longitudinally pulling, by means of a riveting machine 8, on the shank 4, the head portion 5 will expand the enlarged portion 11 of the sleeve 1, in such a way as to press it against the inner surface of the hole.

More specifically, the shank will be pulled in such a way as to cause it to break, at its weakened portion 6, that it as the head portion 5 arrives at the narrowed portion 12. In this condition, the threaded portion 3 of the sleeve 1 will project perpendicularly from the wall, the hole whereof will be suitably covered by the flange portion 2, and the mentioned threaded portion 3 will provide an affixing portion for the desired articles to be applied, such as, for example the bracket member 7 illustrated in Figs. 4 and 5.

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In particular, the nog illustrated in Fig. 7 may be applied in an analogous way to that of the above disclosed embodiment, with the single difference that the nog of Fig. 7, before insertion into the hole 9, is inserted into a hole formed in a bracket 14 or the like element, which is pressed against the wall through the flange 2.

From the Figures and the above disclosure the great advantages characterizing the improved expanding metal nog according to the invention will be self evident.

## CLAIMS

1. An improved expanding nog or insert, for anchoring articles to solid walls, characterized in that it comprises an outer sleeve effective to be engaged in a hole as formed in a wall and provided with an expanding portion and an outer flange, in said sleeve there being slidably housed a shank provided, at said expanding portion, with a countersunk and enlarged head, and projecting from said outer flange for a length effective to be engaged by a riveting machine, said shank being provided, at a region inside said sleeve, with a weakened portion for breaking said shank after the application of said nog.

2. An improved nog, according to the preceding Claim, characterized in that said expanding portion of said outer sleeve 1 is defined by the enlarged portion of a hole formed inside said sleeve and leading to a narrowed portion, said enlarged portion having a diameter less than the diameter of said head, for radially expanding said expanding portion as said head is inserted into said enlarged portion.

3. An improved nog, according to Claim 2, characterized in that said narrowed portion is effective to operate as an abutment member for said shank for breaking said shank at said weakened portion.

4. An improved nog, according to Claim

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1, characterized in that it comprises a threaded portion axially projecting from said outer flange and provided for removably engaging with anchoring elements 7.

5. An improved nog, according to Claim 4, characterized in that said outer flange is effective to contact ~~engage~~ with the outer surface of the wall at the zone of said hole.

6. An expanding nog, according to Claim 1, characterized in that said outer flange is adapted to engage with a supporting element for anchoring to the wall said supporting element.

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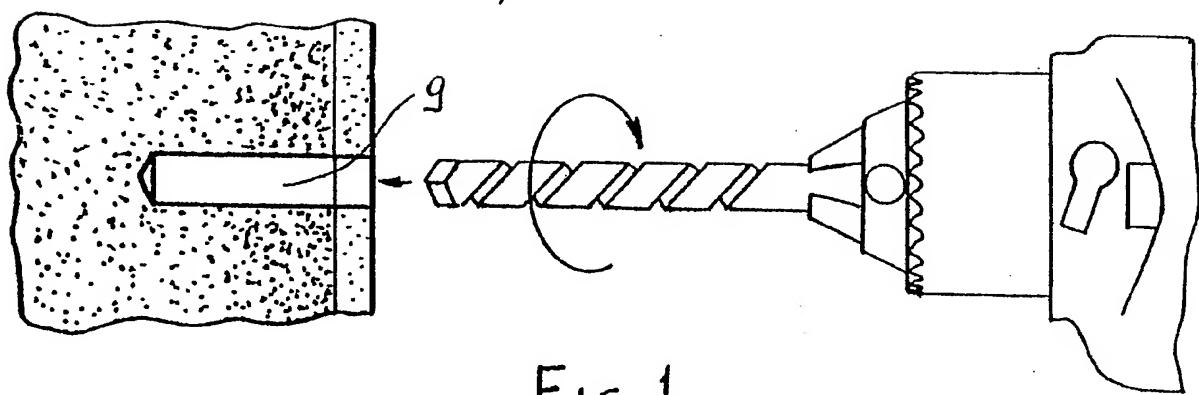


FIG. 1

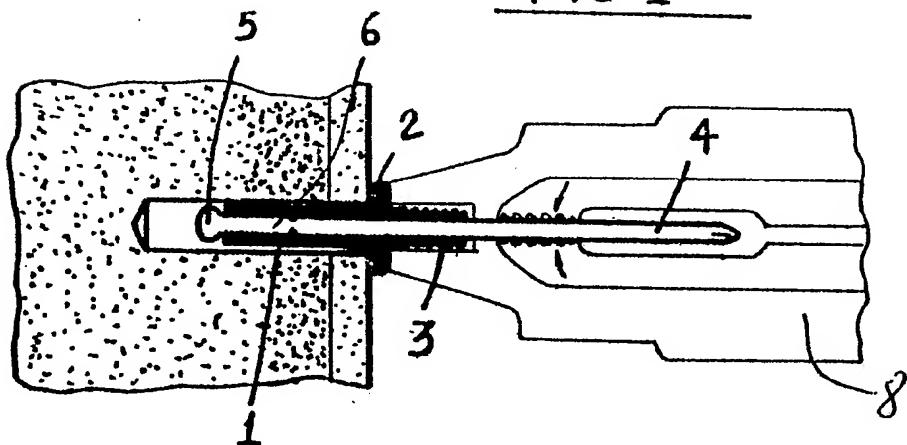


FIG. 2

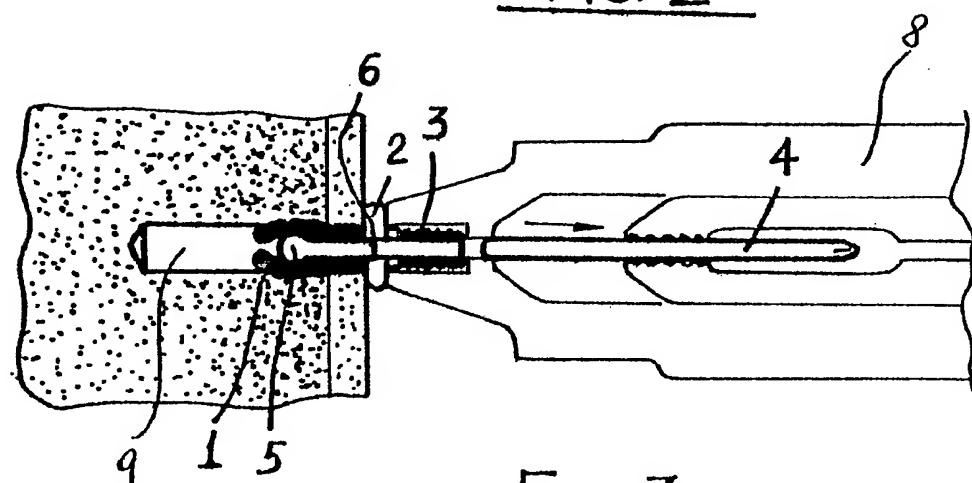


FIG. 3

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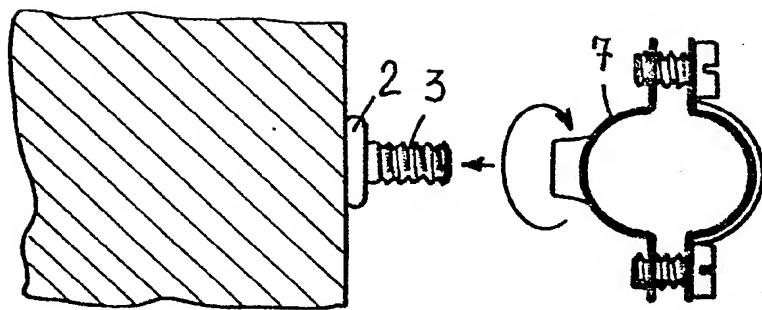


FIG. 4

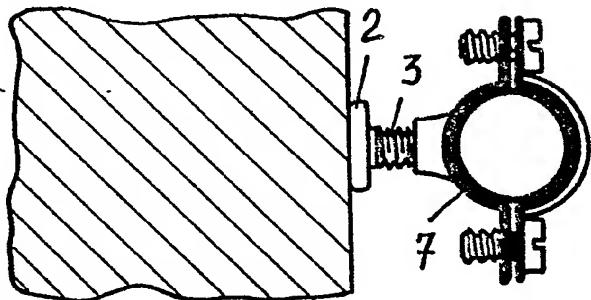


FIG. 5

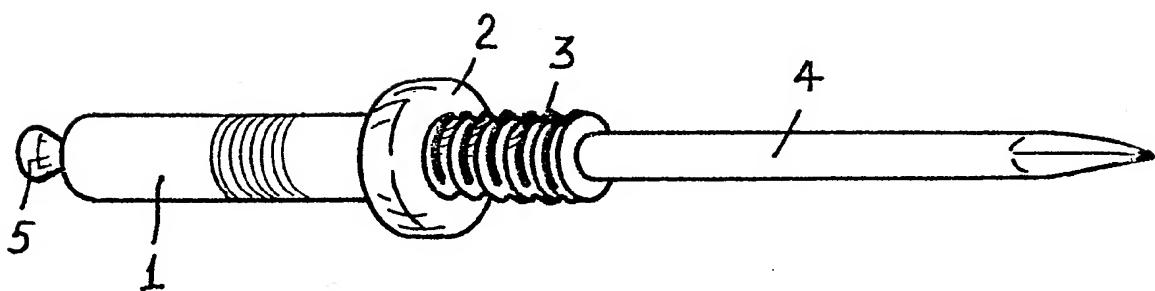


FIG. 6

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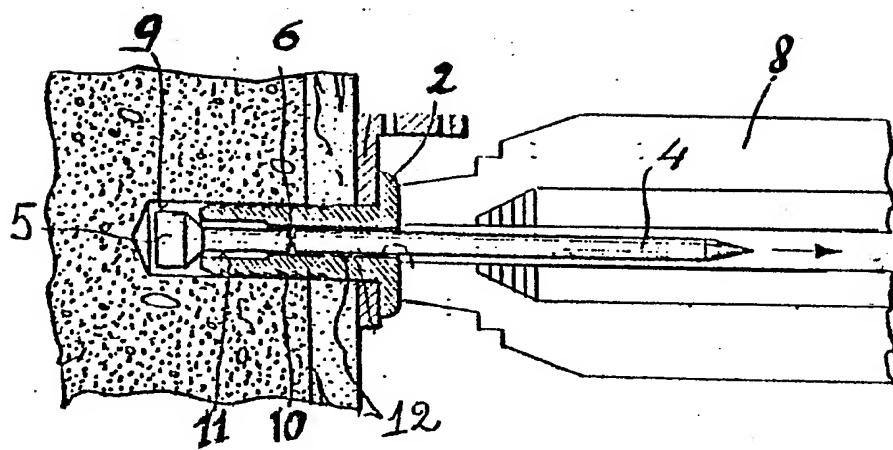


Fig. 7



DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
X	MACHINE DESIGN, vol. 37, no. 6, March 11, 1965, pages 87-89, Penton Publ., Cleveland, US; T.R. FREEMAN: "Blind rivets" * Page 87, figure 1, top-left *	1-3, 5, 6	F 16 B 19/10
X	INDUSTRIAL FASTENERS HANDBOOK, first ed.; 1976, pages 398-400, Trade & Technical Press, Morden, GB; "Blind rivets" * Page 398; figure: "Standard sealed and grooved types of 'pop'rivets", third example *	1-3, 5, 6	
Y	idem	4	
Y	DE-A-2 535 237 (HOFFKNECHT) * Page 5, lines 1-5; figures 1-2 *	4	TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
A	DE-A-2 524 459 (HOFFKNECHT)  -----		F 16 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE	Date of completion of the search 28-06-1984	Examiner VAN DER WAL W	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			